The Journal of Balanced Literacy Research and Instruction

Volume 1 | Issue 2 Article 3

2013

# Infusing Technology into the Balanced Literacy Classroom

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*INVITED PIECE: FOCUS ON TECHNOLOGY*

# Infusing Technology into the Balanced Literacy Classroom

Jennifer W. Shettel, Ed.D. and Kevin Bower, M.Ed.

***Abstract*—**This article focuses attention on how technology is being utilized in classrooms, with an emphasis on literacy learning. The authors explore the integration of technology within a balanced literacy classroom and identify three levels of technology integration commonly found within a typical K-12 classroom. Specific examples are provided for each level and classroom vignettes from the second author's classroom are utilized. In addition, the authors provide suggested resources throughout the article for further exploration.

## THE INFUSED CLASSROOM

Kevin Bower is a 6th grade teacher in a small school district in rural southeastern PA. If you visited Kevin's classroom, you would find students scattered across the room in creative work areas. Bower utilizes Thornburg's (2004) metaphor of the campfire, watering hole, and cave to describe different types of working environments that take place within his classroom on a daily basis. The interactive whiteboard serves as the classroom "campfire," where students gather to hear Mr. Bower or their peers teach a large-group mini-lesson. "Watering holes" are collaborative work stations around the room such as tables, desks, and carpet squares placed around the room. Small groups of students meet at the "watering holes" to complete an assignment or collaborative activity. The students are also able to work in "caves," which are private areas around the room where they can think and reflect on their own. Caves provide privacy and solitude and allow students to work individually. Mr. Bower is most likely found bobbing and weaving among his students' personalized learning areas like a prized fighter in the ring. Each encounter he has with students is efficient, engaging, and enriching. An observer would notice the relationships and respect he has established with his students.

Bower's learning environment sustains a motivation to learn within a constructivist approach to teaching and learning. Literacy and technology are synonymous in his classroom. Mobile devices and computers litter the room as students work on assignments, and students turn pages of text as easily as they scroll the pages on their devices. Technology is used as a springboard to propel his students to a world between and beyond the lines of text as they read and write.

Students utilize classroom computers in an effortless fashion. They collaborate in Edmodo, a social networking site for teachers to use that is similar to Facebook, to discuss their books and to post their final products from assignments. Students read the posts of one another as meticulously as they read the back of a book jacket before making a selection from the classroom library, and are constantly refreshing their browser to review comments and questions from their peers. Web 2.0 tools are continuously being explored to find the perfect medium to respond to books they have read, demonstrate understanding of learning, and create projects that integrate reading, writing, speaking, and listening skills. Students share sites and integrate ideas as they work on assignments in a cooperative and collaborative way. Hovered over computers with their Google Docs open, students edit and shape their writing. The revision history provides a timeline of the writing process as well as the collaboration among the students to finely tune their final draft. Final drafts and final products for almost every assignment are posted on their virtual "Classroom Fridge" on KidBlog. Bower's students publish to the world, rather than just turning assignments in to their teacher.

At the onset of the new century, the International Reading Association released a position statement on "New Literacies and 21st Century Technologies" that was revised in 2009. This document opens with a powerful statement that, "literacy educators have a responsibility to effectively integrate new technologies into the curriculum, preparing students for *the literacy future they deserve*" (p. 2). Bower has certainly accepted that call and risen to the challenge of creating a place of learning that infuses technology across the curriculum that incorporates literacy skills in a seamless integration. Bower's use of technology cultivates a love for reading and writing among his students as he implicitly challenges them to reach their full potential. Technology is not viewed as tools for the classroom, but rather as strategies that foster creativity. Imaginations run wild as students read, write, and create, while technology provides the platform to showcase their thinking and ideas.

## LOOKING BACK TO LOOK FORWARD

In many ways, the rapid development of new technological tools and devices every year cloud the memory of what life was like before each new development. For example, students in today's Kindergarten classes will have no memory of a life before cell

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phones, although it is likely that the cell phone as we know it today will be but a distant memory when these same children enter high school.

In *Education and Technology: Future Visions*, a 1995 report by the U.S. Congress Office of Technology Assessment, the writers envisioned what the year 2005 would bring in terms of technology and technology in schools. Reading this report nearly a decade after the hypothesized year, it is remarkable how the authors' vision of technology in the year 2005 was accurate in terms of the types of tools and devices that would be available, yet off base in how advanced we would in terms of how technology would be used in education. Indeed, the authors of this particular report envisioned 2005 as a year when students and teachers would be actively engaged in project-based learning and cooperative learning utilizing computers and technology tools. They predicted that learning through teamwork and interacting with people from across the globe would be prominent features of schooling in 2005, although they cautioned that such a vision could be thwarted by political pressure to return to a "back to basics" approach (U.S. Congress OTA, 1995, p. 22).

Clearly, a lot has happened since 1995 in the world of education. The *Report of the National Reading Panel* in 2000 (NICHD, 2000) and the passage of the *No Child Left Behind Law* (NCLB, 2002) changed the landscape of the literacy classroom and increased pressure on school districts, which did indeed foster a "back to basics" approach as schools focused attention on the "building blocks" of reading instruction in order to improve scores on state-developed standardized tests. The current adoption of the *Common Core State Standards* (CCSS, 2010) in 45 states across the United States marks a significant period in American education history as this is the first time that multiple states have shared a set of common standards for English-Language Arts and Mathematics. Information dissemination and staff development on the CCSS is currently underway in the adopting states as teachers, school leaders, and state governing agencies work to determine how the "new" standards will change the face of instruction in their classrooms yet again. It is no wonder then that realizing a visionary future in which technology plays an important role alongside that of a highly qualified teacher has not yet been fully realized.

## NEW LITERACIES

Research on technology integration within the classroom is a rapidly growing field in literacy education. Leu and colleagues (2004) have shaped the theoretical perspective of "new literacies," a term which broadly encompasses the vast array of constantly-changing information and communication technologies (ICTs) that guides much of the work in this area. The distinction of the term *literacies* is important because it implies that *literacy* is no longer a single phenomenon or event; instead literacy takes on multiple forms as readers and writers interact with and create texts.

Many schools have shifted their stance on utilizing student-owned devices and are looking for new and innovative ways to incorporate the rapidly changing technology choices in ways that have minimal impact on their overall budget. The recent explosion of "Bring Your Own Device" or BYOD (Raths, 2012) programs being implemented in many K-12 school districts signifies a shift in both thinking and practice. Where once personal computing and handheld devices such as cell phones, tablet computers, or gaming devices had been banned in classrooms, many schools are now inviting students to bring and use these learning tools in the educational setting.

It is imperative therefore that educators and literacy leaders in 21st century schools are able to effectively use technology as they design, implement, and assess learning experiences for students (ISTE, 2008). Recent articles in the field have highlighted the use of iPads (McClanahan, Williams, Kennedy, and Tate, 2012), assistive technology resources (Ruffin, 2012), podcasting (Vasinda & McLeod, 2011), and electronic books, or eBooks (Larson, 2010) as just a few of the innovative ways to connect evidence-based reading research with 21st century tools.

## ENVISIONING THE INFUSION OF TECHNOLOGY INTO THE LITERACY CLASSROOM

Infusing technology into a balanced literacy classroom is not an overnight process. Instead, school leaders should be prepared to assist teachers along a moving staircase of technology use and acquisition. Commonly referenced models in the technology education field include the SAMR model (Puentedura, 2006) and the TPACK model (Mishra & Koehler, 2006). In the SAMR model, Puentedura provides four levels of technology integration: Substitution, Augmentation, Modification, and Redefinition. The SAMR model focuses attention on what can be done with technology within each level. In the TPACK model, a three-way Venn Diagram is used to show how Technological, Pedagogical, and Content Knowledge (Figure 1) are all interrelated with the effectiveness of the classroom teacher.

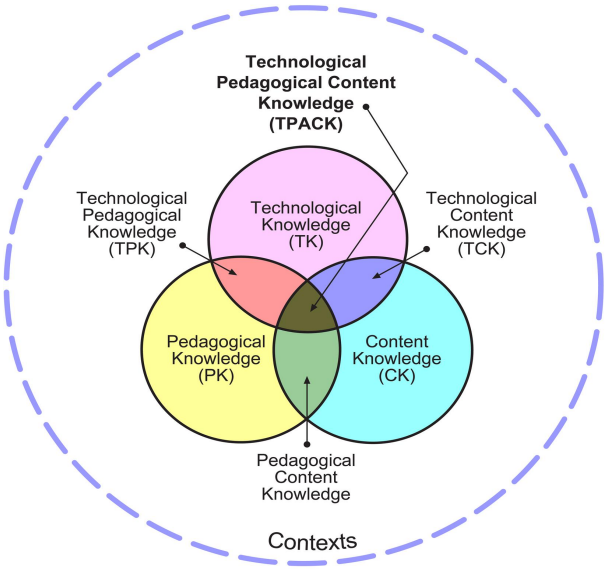


**FIGURE 1.** TPACK Model. Reproduced with permission of the publisher, © 2012 by www.tpack.org


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For the purpose of this article, the authors have re-envisioned the presence of technology in the literacy classroom in conjunction with the technological knowledge base of the teacher into a continuum with three levels: technology as a *novelty*; technology as a *necessity*, and technology as a *natural* component of the classroom. We describe key characteristics of each level, provide explicit examples, and connect with Webb's *Depth of Knowledge* levels (Webb, 2002).

**Level One: Technology as a Novelty**

This level is closely associated with the "Substitution" level of Puentedura's (2006) SAMR Model for technology integration and is best described as the teacher swapping out traditional tools for more technology-based tools. For example, in many classrooms, interactive whiteboards, such as *SMART* or *Promethean* boards, have taken the place of overhead projectors. In a classroom where this tool is viewed as a novelty, teachers use this tool to do the same types of things they did with the old technology-projecting workbook pages, modeling reading practices through a shared reading method, leading a writing exercise, etc. The technology is *there*, but the teacher is unsure of how to use it for more sophisticated measures.

In a classroom that views technology as a novelty, available technology is commonly used as a motivator or "carrot-on-a-stick" to entice students with something special to play with after their "real work" is done. Classroom-based computers are mostly used for educational games or pre-determined websites, and technology is often viewed as a sponge activity to soak up time at the end of the day. Occasionally, technology is utilized as a punishment with the teacher taking away access to technology if students are not following the teacher's explicit directions.

Teachers at this level make comments such as, "I'll never get the hang of all this new technology" and "They gave us this stuff, but I don't really know what to do with it." There is a reliance on the school or district to provide professional development and direct assistance with the new technology.

This level is marked by a high level of teacher control. The teacher determines who is going to use what technology and how it will be used. Little emphasis is placed on allowing students to explore or suggest new ways to use the available technology. Technology integration at the novelty level is often micromanaged by the teacher who may feel overwhelmed.

This is not to say that viewing technology as a novelty is a always a negative approach. Indeed, it is a first step, a starting platform for learning a new tool or device. For instance, a classroom implementing the BYOD initiative for the first time would typically begin by approaching this idea as a novelty. E-readers are substituted for traditional texts, but little instruction or emphasis is placed on learning the tools that accompany such electronic reading systems. Students may be permitted to use their devices in "approved" ways after completing their regular work or assignments.

Assignments that integrate technology at the novelty level are commonly aligned with Webb's Depth of Knowledge (2002) level one activities. The main objective at this level is for the students to recall and reproduce information. This level of integration fosters a classroom culture of consumers, and creativity takes a backseat. Answers do not need to be figured out or solved, and there is little transformation of the targeted task, which is why movement between levels is critical.

In Bower's classroom, he spends the first two weeks of school introducing students to a variety of tools that they can use to replace traditional paper and pencil tasks as well as providing students with exposure to technology integration within the literacy framework. During writing, students type their writing assignments using Microsoft Word or Google Docs. Students are able to edit the document without the need to rewrite drafts, and Bower can insert comments on the document. Typing, cutting, copying, and pasting are key skills with this level of integration.

Students attempting to define words in text selections use Dictionary.com or Visuwords. A thesaurus and dictionary are replaced by the online version, but each still serves the same purpose. Online thesauruses and dictionaries built-in to eReaders allow the students to explore a word's meaning within the text.

SpellingCity.com and online vocabulary games are resources Bower has his students use at the novelty level to increase their knowledge of words. Students often choose these activities after their required work is completed, or as an independent activity at a computer station while the teacher is meeting with guided reading groups. Wordle and Tagxedo are popular word cloud sites that allow students to create visual creations with vocabulary words, spelling words, synonyms, and antonyms.

Bower's students also identify high-interest topics to research. They search for books and materials related to the essential questions or objectives for the activity. Using technology from a novelty standpoint, students might use visual presentation tools such as Prezi, Powtoon, Smore, or PowerPoint to present information recalled from passages of text or online research.

Students in Bower's class read about Ancient Egypt. They visited http://www.virtual-egypt.com/newhtml/glyph/glyph.html to create their own cartouche online. Then, students created their own cartouche on paper, and they were posted on Bower's classroom blog that he calls the Classroom Fridge. Viewing technology as a novelty, the virtual posting site takes the place of the literal display area such as the front of the refrigerator.

**FIGURE 2.** Student generated cartouche.


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Daily Independent Reading Time (DIRT) or Sustained Silent Reading (SSR) online discussion forums are a way to infuse technology into the typical self-selected reading process as well as to build relationships with and between students. In Bower's classroom, he posts a question in Edmodo, an online forum for the students to respond to as an "ice-breaker" before they discuss the book they are reading. Moodle, Edmodo, and many other course management tools offer discussion forum options to promote and support social interaction in your classroom. Sample questions include, "Which recess game do you think would make a great Olympic sport?" Or, "Would you rather be a sports hero, rock star, or the president?" After answering the question the students also write a sentence or two about their self-selected literature book. This provides Bower with an update on where the students are in their books. The post is concluded with a few sentences about what's happening in the student's life. To build classroom community, students are also encouraged to comment on at least one other classmate's post.

Bower's school uses a six-day cycle to organize their school schedule. On cycle day 1 he poses a question to the students in Edmodo for them to answer. However, as the year progresses he moves the forum to KidBlog to allow parents, family, and friends to respond to the questions as well. KidBlog allows Bower to moderate all posts and comments before they appear live. The students love writing the posts and reading comments. The assignment is often the topic of communication before and after school as well as lunch. This platform allows students to be creative and integrate Web 2.0 tools if they wish. The directions for the assignment are listed below:

1. Restate the question in your response and provide a brief rationale.
2. Provide a brief summary of your self-selected book. (2-3 sentences)
3. Write a few sentences about what is happening in your life or provide a thought on a current event. (Events that you have done or are about to do. Or, Can you believe that this happened? I think...)
4. Post a quality comment to at least one classmate. (Ask a thought provoking question or share a common connection.)
5. Use correct conventions.

Bower allows students to complete the posts during any time period, and has found that these informal posts provide him with information that makes face-to-face meetings more efficient. Students who are often reluctant to speak or participant in class have now found a voice in writing and are more easily engaged in conversation. For example, a student may write about an activity he or she participated in the previous evening. Bower might say, "Hey, Suzie! I saw your team won the game last night. How was the game?" Students and teachers can also learn about new books from their classmates from the book summary sentences. The discussion questions provide a fun, short creative writing activity for students. As the school year progresses students can post their own questions or simply write what's on their mind. In this example, online communication is used to foster deeper face-to-face communication.

These literal, level one Webb's Depth of Knowledge (2002) activities provide a solid foundation for technology integration and are an important precursor to developing creativity and critical thinking and moving to higher levels of infusion.

**Level Two: Technology as a Necessity**

As teachers increase their comfort level with the tools and devices in their classrooms, they will gradually phase out traditional methods and rely more heavily on technology-based tools. When this happens, technology becomes a necessary part of the classroom's day-to-day functioning. When unexpected things happen, like Internet servers going down or a school-wide network issue, teachers become frustrated and have to make on-the-spot decisions about how to deliver the instruction without the use of the technology they have come to rely on.

Teachers at this level often say things like, "I can't imagine teaching without it!" when referencing technology and the tools they associate with it. The knowledge level of the teacher who views technology as a necessity is much wider than at the novelty level. At the necessity level, the teacher feels comfortable with a range of tools and devices and may *even* be able to do basic trouble-shooting when problems arise.

At the necessity level, technology is often approached from a "tool-first" standpoint. This means that teachers will focus the teaching on certain tools that they expect students to use, such as PowerPoint or Prezi. The focus is on the tool itself and not as a medium to deliver the content. The tools are often introduced with the assignment and the students spend more time "playing" with the tool instead of completing the assignment.

Activities associated with the necessity level of technology infusion are generally associated with levels two and three on Webb's Depth of Knowledge (2002). The activities require two or more steps and the students are engaged beyond recalling facts. Students are often asked to process information before responding and need to use information in a different manner from the context in which it was learned.

At this level, teachers are willing to give up some control of the technology to the students. They recognize that many of the students are more technology-savvy than themselves and are comfortable capitalizing on this. In Bower's classroom, student TechSperts are identified for different tools and devices. Students take turns being technology experts, and the TechSpert is a regular job on the classroom job chart. Allocating this responsibility to students allows Bower to focus on the content, and the students assist their classmates with the various mediums selected to present their final work.

At the necessity level students are introduced to a limited number of tools when completing assignments, and the tools are taught explicitly. For example, to teach students how to use GarageBand, Bower first had students read an informational selection from their Harcourt Storytown Reading anthology on smoke jumpers. The students then wrote an interview between a reporter and a smoke jumper that had just fought a forest fire. Within the dialogue the students integrated factual information from the selection. Then, they recorded the interview as a podcast. While there was certainly literacy learning going on, the majority of the assignment is focused on learning GarageBand. In this case, the content takes a backseat to the technology.

Another example of integrating technology at this level is to introduce students to web-based tools that allow them to utilize inferencing skills as they expand and elaborate on character traits, emotions, and relationships. Students can create dialogue between


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characters using a text-messaging simulation program called ifaketext (Figure 3). Or have students create Facebook profiles for characters or historical figures using Fakebook. The students can edit the profile as the book progresses and they learn more about the characters or historical figures they are reading about.


**FIGURE 3.** Student generated text message using http://ifaketext.com

Word study activities at the necessity level move beyond looking up words in an online dictionary or using teacher-generated lists on Spelling City to practice their weekly words. At this level, students demonstrate understanding of their spelling or vocabulary words in context using sites like GoAnimate or Pixton. Using web-based presentation tools, students can create slides with images accompanied by sentences with the words correctly used in context. Stupeflix and Animoto are examples of sites that allow the students to easily create a movie with music for this activity. Powtoon, Prezi, and Google Presentation are presentation tools which the students can use to create slideshows of images with the words correctly used in context.

Technology also gives grammar instruction some gusto. While learning how to punctuate dialogue, students can create cartoons using ToonDoo or MakeBeliefsComix.com. At the novelty level students would be identifying the concepts within the text. At the necessity level the students can create their own text to demonstrate understanding of the concepts.

**Level Three: Technology as Natural**

When technology becomes a natural part of the classroom literacy environment, the highest level of infusion has been achieved. At this level, there is a seamless integration of technology along with traditional methods in the classroom. The classroom is a more student-centered place with active learning happening throughout the literacy framework. Students' use of technology tools and participation in technology-driven tasks occurs simultaneously with traditional paper/pencil types of literacy tasks.

Instead of tool-first teaching, the teacher understands that it is always the *learning* that must come first, and that the tools are just one possible way to achieve the learning goals. With a pedagogy-first approach, the students have a choice in deciding which tool will work well to present the content after the main work for the assignment has been completed. Teaching the tool and trying to fit the content into the tool's context often limits the literacy and the creativity of the students. The technology should not drive the instruction; instead, the instruction should drive the technology. This type of teaching and learning supports the constructivist philosophy. Hands-on, minds-on learning activities and assignments are a main goal and focus in the classroom.

Teachers at this level make remarks such as, "It's not the technology, it's what you *do* with it." Classrooms that had previously implemented BYOD initiatives now call it BYO**T** for "Bring Your Own **Tool/Technology**," acknowledging that everyone can bring something to the creative table, whether it be a new iPad or a pack of favorite colored pens. BYOT ensures that more students have the capability of contributing to the assignment. Devices and materials synonymous with "fun", are now integrated seamlessly into regular classroom instruction. In the novelty and necessity level the teacher often makes the decision on the tool(s) used in the assignment and how the students will learn. In the natural infusion setting the students are making decisions for themselves and the teacher is a facilitator to guide the students as they meet their own needs for learning. The students are asking questions instead of the teacher asking questions and they are making discoveries on their own. BYOT also implicitly teaches responsibility while the students are able to be creative and think critically with devices that were once thought of as only entertainment.

At this level, there is a symbiotic relationship when it comes to using the technology. Instead of either controlling or relinquishing/sharing control with students, teachers at this level are fully comfortable in the role as "lead learner," confident that the digital natives in their classrooms will be able to discover and demonstrate ways to use the technology that the teacher had not considered. The classroom could accurately be described as a true digital melting pot filled with both digital natives and digital immigrants.

Technology at the natural level aligns most closely with level four of Webb's Depth of Knowledge (2002). At these levels, students are engaged in extended types of thinking and learning that combine their own content knowledge, technology skills, and creativity. Learning activities at this level call upon students to design, connect, synthesize, analyze, and create in order to demonstrate their learning well beyond the literal level.

Bower embraces a teaching philosophy in which students understand that taking risks and making mistakes are a regular part of learning and conquering new skills. He believes that fear of the unknown stifles the creativity and critical thinking skills of his students, and has created an environment where students know it is alright to fail. Bower believes that when the focus is on the process and not the final product the end results are amazing. In his classroom, technology is a natural part of the classroom

environment and is one tool among many that allows students to put the pieces of the puzzle together as they read or write a passage of text and provides the foundation for students to read as writers and write as readers.

One example of a literacy project Bower uses at this level is having students create a soundtrack to accompany the book they are reading. The students select music and create an album cover that reflects the theme of the book. The students list three to five additional song titles by artists whose work they believe matched the theme or themes of the book. To culminate the activity the students write short paragraphs about the theme of their book and why they chose each song. For example, courage is a key theme of the book *The Hunger Games* by Suzanne Collins. To illustrate that theme, the cover would reflect bravery in some fashion, and a song like "Hero" by Mariah Carey might be selected for the soundtrack.

In the classroom where technology is a natural component, writing extends beyond the world of word processing. Bower encourages students to integrate the arts with writing. After completing a final draft for a writing assignment, students record their narrative or poem as a podcast. Then, they search for music at freeplaymusic.com or other royalty free music sites to find recordings that fit the tone and mood of the passage. This assignment requires higher-level thinking, and it enhances the content by providing non-linguistic context. Students also regularly use Web 2.0 tools such as MyBrainshark, Blabberize, or Fotobabble to showcase their writing through a different medium.

Digital storytelling is another way to increase natural technology infusion accompanied by traditional methods of teaching. An interaction of content and context provides the foundation for digital storytelling. Students' voices are accompanied by images, video, and music that provides a product designed to enthrall the audience. Using digital storytelling tools and apps, such as iMovie, MovieMakerPro, Animoto, and Puppet Pals, students can create a story that meets their needs. Students create a storyboard for their ideas using individual note cards that can be manipulated and rearranged to provide the best possible sequence of events for the story they wish to create.

Digital storytelling is an assignment where both the content and the tools need to be carefully considered simultaneously. In the end product, the emphasis is on the story while the technology provides the vehicle to deliver the message. More elaborate tools can support the story or simple tools with just a photo and the audio work well, too.

When technology becomes a natural part of the classroom environment, the possibilities are limitless, and these are the type of learning experiences that students will never forget. In Bower's classroom, students have created book trailers to promote books in the classroom library or tell another side of a story through a character's point of view. They summarize nonfiction selections and create newscasts with information from the passage. They create stop-animation movies and host simulated talk shows with the author and the characters of the book. In content-rich subjects, students demonstrate understanding by creating stories from the first person point of view of scientific concepts, historical landmarks, and people they have studied.

A popular end-of-year event in Bower's classroom is "Oscar Night," where students invite friends and family to view the films they have created. The students love to "walk the red carpet" and provide a brief explanation of their digital story before viewing it on the "big screen" via the classroom projector. Students recall and vividly discuss great books they have read and things they have learned throughout the year. They are animated in their explanations and clearly "own" the information and the tools that they used to create their movie. Bower believes that when learning makes memories with his students, they will develop the passion to be a lifelong learner. In his classroom, the natural integration of technology within every subject makes those memories HD quality.

**Recap**

To summarize, classrooms may exhibit one, two, or all three of the levels discussed: Technology as a Novelty, Technology as a Necessity, and Technology as Natural. In fact, classrooms that view technology as a **natural** part of the classroom environment also embrace new and **novel** types of technology as well as recognizing the **necessity** of access to technology; while classrooms with teachers who are at the entry-level stage of experimenting with technology may be more apt to view all types of technology as a novelty. When a new device hits the market or a new website is discovered, that technology will be a *novelty*. As students and teachers gain control and understanding of the new technology, the infusion of the tool will flow into the necessity or natural level. At any given time, there can be elements of all three levels occurring simultaneously within the classroom, as Bower has demonstrated. What is critical for the 21st Century literacy classroom is that classroom teachers understand that literacy as formerly defined as primarily paper/pencil based has changed forever and will continue to change as new tools and technologies are invented.

## MANAGEMENT WITHIN THE TECH-INFUSED LITERACY CLASSROOM

Effective management within the balanced literacy classroom is a critical component for achieving productive use of students' time combined with high levels of engage learning and technology infusion. Modeling how to retrieve a laptop or mobile device from the cart is one key to eliminate chaos, but there are also many other factors for technology infusion success. Solid classroom management strategies foster an environment where risks can be taken with both teaching and learning. To illustrate how Bower effectively manages his technology-infused classroom, several examples are provided from his classroom: Tech GPS, a revised approach to the RAFT strategy, visual signaling with Calling Cups, and Student TechSperts.

***Tech GPS:*** Before students integrate technology they need to have some direction on where they are going. Bower uses an analogy with his students comparing a graphic organizer to a Global Positioning System (GPS) device. In his classroom, graphic organizers are called a "Tech GPS" and are key to successful technology integration. An electronic GPS provides directions to travelers and has options for alternate routes if they encounter traffic or construction. Bower teaches students that their "Tech GPS" should provide direction for the assignment while also a revision history to provide accountability as well as a timeline of

***iRAFT***
***Rosa Parks***

| Role | Audience | Format | Topic |
|---|---|---|---|
| Grandparents telling their grandchildren about Rosa Parks and the Montgomery Bus Boycott while sitting on their porch drinking iced tea. | Classmates, teacher, parents, the world! | Digital story using iMovie. This allows us to integrate images and our voice with music. | Rosa Parks and the Montgomery Bus Boycotts |

**FIGURE 4.** Example of student generated *iRAFT* chart from Mr. Bower's class.

the creative process. He is able to informally assess students' contributions in a collaborative learning environment. Assigning each student a color to type their information also provides a visual accountability option along with the revision history. Bower is able to differentiate instruction "behind the scenes" without the need to print multiple organizers. He can challenge or remediate assignments to meet the needs of each learner in the Google Doc.

***iRAFT:*** Using his own version of the RAFT strategy (Santa & Havens, 1995), Bower utilizes this tool to provide direction and help students organize technology-based literacy assignments. The students identify the role and their audience. The topic can be defined by the student or teacher. When describing the format, the students identify the technology they will be using and justify their choice.

For example, Bower's students read an informational text on the Civil Rights movement. In small groups the students were given a famous event or Civil Rights hero to research. After organizing their research on a graphic organizer the students complete a RAFT to plan how to present their information. (See Figure 4).

***Calling Cups***: Movement around the classroom is very important to foster a positive learning environment and minimize off-task behavior. In his classroom, Bower uses different colored plastic drinking cups on the students' desks as a visual signal to meet student needs quickly and effectively. Each student or collaborative group has a blue, yellow, and red cup in a stack. If the blue cup is showing, the students are "cool" and working well. When the yellow cup is showing, the student or students need help, but they can continue working until Bower has a chance to meet with them. A red cup signals that immediate help is needed and work is unable to continue until assistance is provided. The cups are a visual alternative to hand-raising that Bower uses as he moves around the room to answer questions. The cups also provide other information that Bower uses to plan instruction. If all blue cups are showing, the students may need more of a challenge, or if all red cups are showing, Bower will call the students back to the "campfire" to review expectations.

***Student TechSperts:*** TechSperts provide assistance in the classroom with the technology so the teacher can focus on the content. Bower provides students with "sandbox" time to play and


*Each student has a set of calling cups to use when working independently or with a group.*

explore technology at their own speed. This gives the students an opportunity to explore options that for future projects. Students can then become experts on various websites or technology devices. Bower gives students lanyards to wear that say TechSpert or other creative names like Prezi Pal, Google Doc Guru, or Edmodo Einstein to assist their classmates. Integrating technology into the classroom jobs chart allows more students to be involved in the classroom. The TechSperts handle problems in the classroom not related to the content to make the teacher's time more effective and efficient. The teacher is a resource in the classroom, but not the sole resource.

## ASSESSMENT FOR THE 21ST CENTURY

Assessment is also a key component with technology infusion to make sure the students are reaching their full potential. Bower

| Categories | Advanced 4 points | Proficient 3 Points | Developing 2 Points | Beginning 1 Point |
|---|---|---|---|---|
| **Taking Risks** | Actively seeks out and follows through on an untested and potentially risky directions or approaches to the assignment in the final product. | Incorporates new directions or approaches to the assignment in the final product. | Considers new directions or approaches without going beyond the guidelines of the assignment. | Stays strictly within the guidelines of the assignment. |
| **Innovative & Creative Thinking** | Extends a novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries. | Creates a novel or unique idea, question, format, or product. | Experiments with creating a novel or unique idea, question, format, or product. | Reformulates a collection of available ideas. |
| **Content Accuracy & Application (Worth Double-Points)** | Accurately provides information while connecting concepts beyond definitions. | Accurately provides information without applying concepts more broadly. | Provides basic information. | Provides inaccurate information. |

**FIGURE 5.** Risk Taking and Creativity Rubric adapted from AACU Creative Thinking for assessing use of technology.

provides a rubric (Figure 5) that fosters creativity and risk taking to ensure that the students are always problem solving and developing their technology skills. Innovative and creative thinking are the keystones of all projects involving technology. Both are necessary to make the content come alive. It is also important to provide benchmarks for the students throughout the assignment to keep them focused on the task at hand. Establishing benchmarks allows Bower to "chunk" activities to differentiate instruction for the students and makes the tackling of large projects less intimidating for students.


*Mr. Bower's students use print resources and technology to collaborate on a create response assignment.*

## FINAL THOUGHTS

In conclusion, the fusion of literacy and technology is no longer a "future-forward" idea. The future is now. The education field is at the threshold of this exciting new frontier, and there will be many lessons to learn about effective implementation along the way. Teachers must be willing to explore new technologies and make a commitment to further developing their own technology skills. This commitment allows teachers be active participants in discovering the many ways that technology can revolutionize and transform learning within and beyond the balanced literacy classroom in order to effectively teach 21st Century learners. It is time for technology integration in the literacy classroom to move beyond the "novel" idea. Indeed, it is high time that we viewed technology as a "necessity" so that it becomes a "natural" part of the literacy classroom environment. Technology integration equals literacy without limits. The pedagogy of technology integration is growing exponentially, providing a basis for further exploration and the development of new best practices. When literacy learning is leveraged with technology education, the goal of infusing technology as a natural part of the classroom environment will flourish, and we will be able to instill in our students the skills needed to conquer and create technologies and devices that are yet to come.

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ISSN:2328-0816